

10/757,832 (60005161-0168)

REMARKS

Interview

Applicant thanks Examiner Chen for the courtesies extended in a telephonic interview on December 13, 2005. No conclusions were reached on the patentability of any claims.

Claim amendments

In the present paper, claim 36 has been amended, claims 37-45 are canceled, and new claims 63-73 are added. In previous amendments, claims 1-11 and 15-35 were canceled, and claims 12-14 and 46-62 were withdrawn from consideration as a result of a restriction requirement. Accordingly, claims 36 and 63-73 are presently under examination.

Claim 36 as amended finds support at least on page 5 lines 12-20.

Claim 63 finds support at least on page 5 lines 12-20.

Claim 64 finds support at least on page 5 lines 12-20.

Claim 65 finds support at least on page 5 lines 12-20.

Claim 66 finds support at least on page 5 lines 12-20.

Claim 67 finds support at least on page 12 line 28-page 13 line 8.

Claim 68 finds support at least on page 12 line 28-page 13 line 8.

Claim 69 finds support at least on claim 7 as originally filed.

Claim 70 finds support at least on page 5 lines 1-10.

Claim 71 finds support at least on claim 10, 13 and 16 as originally filed.

Claim 72 finds support at least on claim 13 as originally filed.

Claim 73 finds support at least on claim 16 as originally filed.

Responses to Examiner's statements

2. Specification

In the Office Action, the PTO objected to Figure 3 as allegedly unclear concerning reference to SEQ ID NO: 21-48. Applicant requests reconsideration and withdrawal of the objection, because the listed sequences correspond to those disclosed in the sequence listings.

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3. Information Disclosure Statement

In the Office Action, the PTO asserted that the first 22 references of 159 cited in the PTO form 1449 originally submitted with the application did not reveal any significant information relation to the claimed invention. In addition, the PTO stated that "Applicant has not provided an explanation of why the 150 references are relevant to the claimed invention." In view of the PTO's assessment, Applicant provides herein a revised form 1449 for consideration.

4. Claim rejections under 35 USC § 112, first paragraph regarding written description.

In the Office Action, the PTO rejected claims 36-45 for allegedly failing to comply with the written description requirement. Applicant requests reconsideration and withdrawal of the rejection, because the virus has been deposited in a patent depository, thereby satisfying the written description requirement as set forth in *Enzo Biochem Inc. v. Gen-Probe Inc.*, 63 USPQ2d 1609 (Fed. Cir. 2002), and because viral sequences are provided in the specification.

In the Office Action, the PTO cites *Vas-Cath Inc. v. Mahurkar*, 19 USPQ2d 1111 (Fed. Cir. 1991); *Fiers v. Revel*, 25 USPQ2d 1601 (Fed. Cir. 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016 (Fed. Cir. 1991) for the propositions that "applicant must convey with reasonable clarity to those skilled in the art that...he or she was in possession of the invention," and that "Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required...One cannot describe what one has not conceived." The PTO applied these cases to the present claims, concluding that "the skilled artisan cannot envision the detailed chemical structure of the encompasses genus of polypeptides, and therefore conception is not achieved until reduction to practice as occurred, regardless of the complexity of simplicity of the method of isolation."

However, the Federal Circuit has held, in the more recent *Enzo* decision, that the written description requirement for biological material can be met by a deposit of biological material in a patent depository. In the present case, the written description requirement has been met, because MNV-1 was deposited by the inventor in a recognized patent depository, the American Type Culture Collection (ATCC). In this connection, a receipt of deposit and statement of viability issued by the ATCC are appended to this paper.

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In addition, the PTO itself recognizes that an inventor can be in possession of an invention that includes a molecule, without knowledge of the precise structure of the molecule. In this connection, the PTO's own *Revised Interim Written Description Guidelines Training Materials* states, in Example 16 on page 59 regarding claims to antibodies, that "general knowledge in the art is such that antibodies are structurally well characterized. It is well known that all mammals produce antibodies and they exist in five isotypes, IgM, IgG, IgD, IgA, and IgE. Antibodies contain an effector portion which is the constant region and a *variable region* that contains the antigen binding site" (emphasis added). A claim to "an isolated antibody capable of binding to antigen X," therefore, meets the written description requirement, in spite of the sequence diversity inherent in variable regions of antibodies.

Accordingly, unlike either *Fiers* or *Amgen*, but in line with both *Enzo* and the PTO's own *Revised Interim Written Description Guidelines*, the claims meet the criteria for written description because they are directed to methods which recite elements which include detection of serum antibody which binds to a deposited virus (or to a polypeptide encoded by the deposited virus). Applicant, therefore, requests reconsideration and withdrawal of the rejection.

In the Office Action, the PTO also bases the rejection for written description on the assertion that "the claims encompass a large genus of MNV-1 polypeptides for which Applicant has not provided adequate disclosure such that one of skill would be put in possession of the claimed invention," and further states that "the only factor present in the claim is a general structural feature: 'a MNV-1 polypeptide'. The MNV-1 complete sequence is 1625 amino acids long. Applicant has not provided information as to the location of open reading frames. One would not be able to practice the claimed method without knowing the basic coding regions."

Applicant respectfully disagrees with the PTO's assessments and requests reconsideration and withdrawal of the rejection, because knowledge of the location in the viral genome of any viral open reading frame is irrelevant to practice of the claimed methods. Nonetheless, such information is, in fact, present by virtue of an MNV-1 deposit, and because the caption of the sequence listing of SEQ ID NO: 1 explicitly recites the locations of ORF1, ORF2 and ORF3. Furthermore, the amino acid sequences encoded by these ORF's are recited in SEQ ID NO's 2, 3, and 4 respectively.

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Accordingly, Applicant requests reconsideration and withdrawal of this rejection under 35 USC § 112, first paragraph regarding written description.

In the Office Action, the PTO asserts that "claim 43 requires that a polypeptide comprising the capsid protein be used in the assay. One of skill in the art would need to perform further research to determine where the capsid protein is." Applicant requests reconsideration and withdrawal of this rejection, because a) the claimed methods can be practiced in the complete absence of any knowledge of "where the capsid protein is," b) the specification describes the capsid protein in the specification in sufficient detail for a person of skill in the art to identify it or a nucleic acid encoding the capsid protein, for example on page 3 lines 19-26; page 7 line 29-page 8 line 1; page 9 lines 12-21; page 17 line 19-page 18 line 2; and in the sequence listings for SEQ ID NO: 1 and SEQ ID NO: 3, and c) virus deposited by the Applicant with the ATCC comprises capsid protein as well as nucleic acid encoding capsid protein, thereby meeting the written description requirement under *Enzo*, supra. The capsid protein, therefore, is described sufficiently for a person of skill in the art to conclude that Applicant is in possession of the invention. Accordingly, Applicant requests reconsideration and withdrawal of this rejection under 35 USC §112, first paragraph regarding written description.

5. Claim rejections under 35 USC § 112, first paragraph regarding enablement.

In the Office action, the PTO rejected claims 36-45 for allegedly failing to comply with the enablement requirement, stating that undue experimentation is required to practice the claims. Applicant requests reconsideration and withdrawal of the rejection, in that the enablement requirement can be met by deposit of a virus. See *Enzo*, supra.

In the Office Action, the PTO states that "one of skill in the art would not be equipped to practice the claimed method: detection of MNV-1 antibodies. The method requires the use of MNV-1 polypeptides that contain epitopes or in some instances, the capsid protein. The instant specification lacks working examples and fails to adequately teach where these epitopes are, or even where the major viral proteins are in the full-length sequence. The MNV-1 complete sequence is 1625 amino acids long. Applicant has not provided information as to the location of open reading frames."

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Applicant requests reconsideration and withdrawal of this rejection, because deposit of biological material provides enabling sequence information. It is well established that deposit of biological material can be enabling. *Enzo* at 1614 ("A person of skill in the art, reading the accession numbers in the patent specification, can obtain the claimed sequences from the ATCC depository by following the appropriate techniques to excise the nucleotide sequences from the deposited organisms containing those sequences"); *In re Argoudelis*, 168 USPQ 99 (CCPA 1970) (enablement requirement met by deposit of a microorganism in patent application claiming antibiotic compounds that produced by a microorganism). In this case, the MNV-1 virus has been deposited with the ATCC, as described supra. The deposit enables a person of skill in the art to determine sequences, and therefore obtain polypeptides without undue experimentation. Applicant, accordingly, requests reconsideration and withdrawal of the rejection regarding enablement under 35 USC § 112 first paragraph.

In the present Office Action, the PTO asserts as grounds for rejection an alleged lack of working examples. Applicant requests reconsideration and withdrawal of the rejection on these grounds, because the specification explicitly provides working examples. See, for example, Figure 7 and its description on page 5; Figure 9 and its description on page 6; page 12 line 28 through page 13 line 12; Example 6 on page 17-18; Example 7 on page 18; Example 9 on pages 18-19; and Examples 10-12 on pages 19-20. Furthermore, the PTO's statement that the specification fails to teach where the epitopes are located is incorrect. Epitopes are, by definition, structures within antigens (such as proteins) which are recognized by antibody molecules. Epitopes are inherent in the antigens, in this case MNV-1 polypeptides; therefore, their "locations" are disclosed. Furthermore, the PTO's statement that "The MNV-1 complete sequence is 1625 amino acids long" is incorrect. One viral translation product, the "polyprotein" with sequence recited in SEQ ID No. 2 as ORF1, which contains 1625 amino acids by conceptual translation. There are also separate polypeptides encoded in ORF2 and ORF3, disclosed as SEQ ID NO:3 and SEQ ID NO: 4, respectively. In addition, the PTO's assertion that "Applicant has not provided information as to the location of open reading frames" is both incorrect as well as irrelevant to practice of the present methods being claimed. However, the open reading frames are disclosed, at least in the sequence listings; and furthermore can be determined from the deposited virus. Accordingly, the present claims are fully enabled and,

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therefore, Applicant requests reconsideration and withdrawal of the claim rejections regarding enablement under 35 USC § 112 first paragraph.

6. Claim rejections under 35 USC § 112, first paragraph regarding enablement.

In the Office Action, the PTO rejects claims 36-45 for allegedly failing to comply with the enablement requirement, because, in the PTO's opinion, MNV-1 itself is required to practice the claimed invention. Applicant requests reconsideration and withdrawal of this rejection because a) the virus itself is not necessary to practice the invention, b) the virus is already on deposit in a patent depository, and c) an affidavit is appended to the present paper stating that the deposit has been made under the terms of the Budapest Treaty and that all restrictions on availability will be irrevocably removed upon grant of a patent.

With regard to the claims under examination, no undue experimentation is required to practice the claimed methods even in the absence of the virus because sequences of MNV-1 polypeptides and nucleic acids are disclosed in the specification. Synthetic methods for generating peptides and nucleic acids were well known and routine in the art prior to the date of filing of the present application. Because synthesis of a peptide can be based upon a sequence of MNV-1 disclosed in the specification, no undue experimentation is required to synthesize a peptide comprising an MNV-1 sequence. Accordingly, one of skill in the art can practice the claimed methods without any access whatsoever to the virus itself. Nonetheless, as stated supra, the inventor has already deposited the virus in the patent depository of the American Type Culture Collection, and has appended to the present paper a copy of an affidavit removing restrictions to access upon grant of a patent. Therefore, the application is fully enabled. Applicant thus requests reconsideration and withdrawal of the rejection for enablement under 35 USC § 112, first paragraph regarding deposit of the MNV-1 virus.

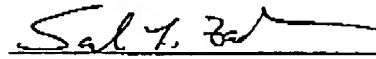
Conclusion

Applicant believes that the application is in condition for allowance. Favorable action including a Notice of Allowance is requested. The Examiner is invited to contact the undersigned attorney by telephone if she believes that prosecution of this application would benefit from further discussion.

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Respectfully submitted,

Date: 22 Dec 2005



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**BUDAPEST TREATY ON THE INTERNATIONAL RECOGNITION OF
THE DEPOSIT OF MICROORGANISMS FOR THE PURPOSES OF PATENT PROCEDURE**

INTERNATIONAL FORM

**RECEIPT IN THE CASE OF AN ORIGINAL DEPOSIT ISSUED PURSUANT TO RULE 7.3
AND VIABILITY STATEMENT ISSUED PURSUANT TO RULE 10.2**

To: (Name and Address of Depositor or Attorney)

Washington University School of Medicine
Department of Pathology & Immunology
Attn: Herbert W. Virgin, IV, M.D., Ph.D.
660 E. Euclid Avenue
St. Louis, MO 63110

Deposited on Behalf of: Washington University School of Medicine

Identification Reference by Depositor:

Murine norovirus 1 (MNV-1): CW1

Patent Deposit Designation

PTA-5935

The deposit was accompanied by: a scientific description a proposed taxonomic description indicated above.

The deposit was received April 27, 2004 by this International Depository Authority and has been accepted.

AT YOUR REQUEST: X We will inform you of requests for the strain for 30 years.

The strain will be made available if a patent office signatory to the Budapest Treaty certifies one's right to receive, or if a U.S. Patent is issued citing the strain, and ATCC is instructed by the United States Patent & Trademark Office or the depositor to release said strain.

If the culture should die or be destroyed during the effective term of the deposit, it shall be your responsibility to replace it with living culture of the same.

The strain will be maintained for a period of at least 30 years from date of deposit, or five years after the most recent request for a sample, whichever is longer. The United States and many other countries are signatory to the Budapest Treaty.

The viability of the culture cited above was tested November 17, 2004. On that date, the culture was viable.

International Depository Authority: American Type Culture Collection, Manassas, VA 20110-2209 USA.

Signature of person having authority to represent ATCC:

Marie Harris
Marie Harris, Patent Specialist, ATCC Patent Depository

Date: January 10, 2005

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Affidavit of Deposit

1. Washington University in St. Louis is the owner of patent application 10/757,832, "Murine Calicivirus," filed January 14, 2004, Herbert W. Virgin IV, inventor.
2. Murine Norovirus 1 (MNV-1):CW1 was deposited for patent deposit purposes on April 27, 2004 in the American Type Culture Collection, 10801 University Boulevard, Manassas, VA 20110-2209, a recognized patent depository. The deposit was assigned accession number PTA-5935. The viability was tested November 17, 2004 and the deposited material was found viable.
3. The deposit was made under the terms of the Budapest Treaty.
4. All restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of a patent.



Michael Douglas

Associate Vice Chancellor

12/21/05
Date

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